Chapter 173-407 WAC

CARBON DIOXIDE MITIGATION PROGRAM FOR FOSSIL-FUELED THERMAL ELECTRIC GENERATING FACILITIES

NEW SECTION

WAC 173-407-010 Policy and purpose. (1) It is the policy of the state to require mitigation of the emissions of carbon dioxide (CO_2) from all new and certain modified fossil-fueled thermal electric generating facilities with station generating capability of more than 25 MWe.

(2) A fossil-fueled thermal electric generating facility is not subject to the requirements of chapter 173-401 WAC solely due to its emissions of CO_2.

(a) Emissions of other regulated air pollutants must be a large enough quantity to trigger those requirements.

(b) For fossil-fueled thermal electric generating facilities that are subject to chapter 173-401 WAC, the CO_2 mitigation requirements are an applicable requirement under that regulation.

(3) A fossil-fueled thermal electric generating facility not subject to the requirements of chapter 173-401 WAC is subject to the requirements of the registration program in chapter 173-400 WAC.

NEW SECTION

WAC 173-407-020 Definitions. The definitions in this section are found in RCW 80.70.010 (2004) and apply throughout this chapter unless clearly stated otherwise. The definitions are reprinted below.

(1) "Applicant" has the meaning provided in RCW 80.50.020 and includes an applicant for a permit for a fossil-fueled thermal electric generation facility subject to RCW 70.94.152 and 80.70.020 (1)(b) or (d).

(2) "Authority" means any air pollution control agency whose jurisdictional boundaries are coextensive with the

boundaries of one or more counties.

(3) "Carbon credit" means a verified reduction in carbon dioxide or carbon dioxide equivalents that is registered with a state, national, or international trading authority or exchange that has been recognized by the council.

(4) "Carbon dioxide equivalents" means a metric measure used to compare the emissions from various greenhouse gases based upon their global warming potential.

(5) "Cogeneration credit" means the carbon dioxide emissions that the council, department, or authority, as appropriate, estimates would be produced on an annual basis by a stand-alone industrial and commercial facility equivalent in operating characteristics and output to the industrial or commercial heating or cooling process component of the cogeneration plant.

(6) "Cogeneration plant" means a fossil-fueled thermal power plant in which the heat or steam is also used for industrial or commercial heating or cooling purposes and that meets federal energy regulatory commission standards for qualifying facilities under the Public Utility Regulatory Policies Act of 1978.

(7) "Commercial operation" means the date that the first electricity produced by a facility is delivered for commercial sale to the power grid.

(8) "Council" means the energy facility site evaluation council created by RCW 80.50.030.

(9) "Department" means the department of ecology.

(10) "Fossil fuel" means natural gas, petroleum, coal, or any form of solid, liquid, or gaseous fuel derived from such material to produce heat for the generation of electricity.

(11) "Mitigation plan" means a proposal that includes the process or means to achieve carbon dioxide mitigation through use of mitigation projects or carbon credits.

(12) "Mitigation project" means one or more of the following:

(a) Projects or actions that are implemented by the certificateholder or order of approval holder, directly or through its agent, or by an independent qualified organization to mitigate the emission of carbon dioxide produced by the fossil-fueled thermal electric generation facility. This term includes, but is not limited to, the use of energy efficiency measures, clean and efficient transportation measures, qualified alternative energy resources, demand side management of electricity consumption, and carbon sequestration programs;

(b) Direct application of combined heat and power (cogeneration);

(c) Verified carbon credits traded on a recognized trading authority or exchange; or

(d) Enforceable and permanent reductions in carbon dioxide

or carbon dioxide equivalents through process change, equipment shutdown, or other activities under the control of the applicant and approved as part of a carbon dioxide mitigation plan.

(13) "Order of approval" means an order issued under RCW 70.94.152 with respect to a fossil-fueled thermal electric generation facility subject to RCW 80.70.020 (1)(b) or (d).

(14) "Permanent" means that emission reductions used to offset emission increases are assured for the life of the corresponding increase, whether unlimited or limited in duration.

(15) "Qualified alternative energy resource" has the same meaning as in RCW 19.29A.090.

(16) "Station generating capability" means the maximum load a generator can sustain over a given period of time without exceeding design limits, and measured using maximum continuous electric generation capacity, less net auxiliary load, at average ambient temperature and barometric pressure.

(17) "Total carbon dioxide emissions" means:

(a) For a fossil-fueled thermal electric generation facility described under RCW 80.70.020 (1)(a) and (b), the amount of carbon dioxide emitted over a thirty-year period based on the manufacturer's or designer's guaranteed total net station generating capability, new equipment heat rate, an assumed sixty percent capacity factor for facilities under the council's jurisdiction or sixty percent of the operational limitations on facilities subject to an order of approval, and taking into account any enforceable limitations on operational hours or fuel types and use; and

(b) For a fossil-fueled thermal electric generation facility described under RCW 80.70.020 (1)(c) and (d), the amount of carbon dioxide emitted over a thirty-year period based on the proposed increase in the amount of electrical output of the facility that exceeds the station generation capability of the facility prior to the applicant applying for certification or an order of approval pursuant to RCW 80.70.020 (1)(c) and (d), new equipment heat rate, an assumed sixty percent capacity factor for facilities under the council's jurisdiction or sixty percent of the operational limitations on facilities subject to an order of approval, and taking into account any enforceable limitations on operational hours or fuel types and use.

NEW SECTION

WAC 173-407-030 Carbon dioxide mitigation program applicability. (1) **Statutory authority for a carbon dioxide mitigation program.** RCW 70.94.892(1) states that "*For fossil-fueled electric generation facilities having more than twenty-five thousand kilowatts station generating capability but less than three hundred fifty thousand kilowatts station generation capability, except for fossil-fueled floating thermal electric generation facilities under the jurisdiction of the energy facility site evaluation council pursuant to RCW 80.50.010, the department or authority shall implement a carbon dioxide mitigation program consistent with the requirements of chapter 80.70 RCW.*"

(2) **Statutory carbon dioxide mitigation program applicability requirements.** RCW 80.70.020 describes the applicability requirements and is reprinted below:

(1) The provisions of this chapter apply to:

(a) New fossil-fueled thermal electric generation facilities with station-generating capability of three hundred fifty thousand kilowatts or more and fossil-fueled floating thermal electric generation facilities of one hundred thousand kilowatts or more under RCW 80.50.020 (14)(a), for which an application for site certification is made to the council after July 1, 2004;

(b) New fossil-fueled thermal electric generation facilities with station-generating capability of more than twenty-five thousand kilowatts, but less than three hundred fifty thousand kilowatts, except for fossil-fueled floating thermal electric generation facilities under the council's jurisdiction, for which an application for an order of approval has been submitted after July 1, 2004;

(c) Fossil-fueled thermal electric generation facilities with station-generating capability of three hundred fifty thousand kilowatts or more that have an existing site certification agreement and, after July 1, 2004, apply to the council to increase the output of carbon dioxide emissions by fifteen percent or more through permanent changes in facility operations or modification or equipment; and

(d) Fossil-fueled thermal electric generation facilities with station-generating capability of more than twenty-five thousand kilowatts, but less than three hundred fifty thousand kilowatts, except for fossil-fueled floating thermal electric generation facilities under the council's jurisdiction, that

have an existing order of approval and, after July 1, 2004, apply to the department or authority, as appropriate, to permanently modify the facility so as to increase its station-generating capability by at least twenty-five thousand kilowatts or to increase the output of carbon dioxide emissions by fifteen percent or more, whichever measure is greater.

(3) **New facilities.** Any fossil-fueled thermal electric generating facility is required to mitigate CO_2 emissions as described in chapter 80.70 RCW, if the facility meets the following criteria:

(a) An application was received after July 1, 2004;

(b) The station-generating capability is below 350 MWe and above 25 MWe;

(c) The facility is not a fossil-fueled floating thermal electric generation facility subject to regulation by the energy facility site evaluation council.

(4) **Modifications to existing facilities.** A fossil-fueled thermal electric generating facility seeking to modify the facility or any electrical generating units is required to mitigate the increase of the emission of CO_2, as described in RCW 80.70.020, when the following occur:

(a) The application was received after July 1, 2004;

(b) The unmodified station generating capability is more than 25 MWe and less than 350 MWe;

(c) The modification to the fossil-fueled thermal electric generating facility or units will increase electrical output by the greater of:

(i) At least 25 MWe; or

(ii) An increase in the annual emissions of CO_2 of 15% or more;

(d) The facility or the modification is not under the jurisdiction of the energy facility site evaluation council;

(5) **Examples of fossil-fueled thermal electric generation units.** The following are some examples of fossil-fueled thermal electric generating units:

(a) Coal, oil, natural gas, or coke fueled steam generating units (boilers) supplying steam to a steam turbine - electric generator;

(b) Simple cycle combustion turbine attached to an electric generator;

(c) Combined cycle combustion turbines (with and without duct burners) attached to an electric generator and supplying steam to a steam turbine - electric generator;

(d) Coal gasification units, or similar devices, where the synthesis gas produced is used to fuel a combustion turbine, boiler or similar device used to power an electric generator;

(e) Hydrocarbon reformer emissions where the hydrogen produced is used in a fuel cell.

NEW SECTION

WAC 173-407-040 Carbon dioxide mitigation program fees. (1) **Statutory authorization.** RCW 70.94.892 authorizes the department to determine, assess, and collect fees sufficient to cover costs to review and approve or deny the carbon dioxide mitigation plan components of an order of approval. The order of approval will specify costs to monitor conformance related to the carbon dioxide mitigation plan.

(2) **Fees.** The fees for the carbon dioxide mitigation program are described in this section and listed in the table below. The fees listed are added to the fees established in chapters 173-400 and 173-401 WAC, when the carbon dioxide mitigation plan requirements are triggered.

Activity	**Fee**
a. Application Review	$65.00/hr[1] not to exceed $500.00
b. Mitigation Plan approval	
i. Payment to third party	$100[2]
ii. Purchase of CO_2 credits	$65.00/hr[3]
iii. Direct investment	$65.00/hr[4]
c. Routine Compliance Monitoring	
i. Payment to third party	$100[5] annually until full amount paid
ii. Purchase of CO_2 credits	$65.00/hr[6]
iii. Applicant Controlled Project	$65.00/hr[7]

[1]Estimated using an EE3 per hour rate with a cap.
[2]Small fee primarily to check math and that the source is using an EFSEC approved qualified organization.
[3]Estimated EE3 per hour rate to check that the credits purchased will be verifiable and from a reputable trading or marketing organization.
[4]Estimated using an EE3 per hour rate.
[5]Same as rationale for [2] above.
[6]Verify and confirm credits with the trading or marketing organization.

(3) The department or authority may use RCW 70.94.085 to structure a cost-reimbursement agreement with the applicant.

NEW SECTION

WAC 173-407-050 Calculating total carbon dioxide emissions to be mitigated. (1) **Step 1 is to calculate the total quantity of CO_2.** The total quantity of CO_2 is referred to as the **maximum potential emissions of CO_2.** The maximum potential emissions of CO_2 is defined as the annual CO_2 emission rate. The annual CO_2 emission rate is derived by the following formula or similar analysis:

$$CO_{2rate} = \frac{F_s \times K_s}{2204.6} \times T_s + \frac{F_1 \times K_1}{2204.6} \times T_1 + \frac{F_2 \times K_2}{2204.6} \times T_2 + \frac{F_3 \times K_3}{2204.6} \times T_{3\ldots} + \frac{F_n \times K_n}{2204.6} \times T_n$$

$CO_{2\ rate}$	=	Maximum potential emissions in metric tons per year
F_{1-n}	=	Maximum design fuel firing rate in mmBtu/hour calculated as manufacturer/designer's guaranteed total net station generating capability in MWe times the new equipment heat rate in Btu/MWe
K_{1-n}	=	Conversion factor for the fuel(s) being evaluated in lb CO_2/mmBtu for fuel F_n
T_{1-n}	=	Hours per year fuel F_n is allowed to be used. The default is 8760 hours unless there is a limitation on hours in an order of approval
F_s	=	Maximum design supplemental fuel firing rate in mmBtu/hour
K_s	=	Conversion factor for the supplemental fuel being evaluated in lb CO_2/mmBtu for fuel F_n given fuel
T_s	=	Hours per year supplemental fuel F_n is allowed. The default is 8760 hours unless there is a limitation on hours in an order of approval

(a) When there are multiple new fossil-fueled electric generating units, the above calculation will be performed for each unit and the total CO_2 emissions of all units will be summed.

(b) When a unit or facility is allowed to use multiple fuels, the maximum allowed hours on the highest CO_2 producing fuels will be utilized for each fuel until the total of all hours per fuel add up to the allowable annual hours.

(c) When a new unit or facility is allowed to use multiple fuels without restriction in its approval order(s), this calculation will be performed assuming that the fuel with the highest CO_2 emission rate is used 100% of the time.

(d) When the annual operating hours are restricted for any reason, the total of all T_{1-n} hours equals the annual allowable hours of operation in the Order of Approval.

(e) Fuel to CO_2 conversion factors:

Fuel	K_n lb/mmBtu
#2 oil	158.16

#4 oil	160.96
#6 oil	166.67
Lignite	328.57
Sub-bituminous coal	282.94
Bituminous coal, low volatility	312.50
Bituminous coal, medium volatility	274.55
Bituminous coal, high volatility	306.11
Natural gas	117.6
Propane	136.61
Butane	139.38
Petroleum coke	242.91
Coal coke	243.1
Other fuels	Calculate based on carbon content of the fossil fuel and application of the gross heat content (higher heating value) of the fuel

(2) **Step 2 - Insert the annual CO_2 rate to determine the total carbon dioxide emissions to be mitigated.** The formula below includes specifications that are part of the total carbon dioxide definition:

Total CO_2 Emissions = CO_{2rate} x 30 x 0.6

(3) **Step 3 - Determine and apply the cogeneration credit (if any).** Where the cogeneration unit or facility qualifies for cogeneration credit, the cogeneration credit is the annual CO_2 emission rate (in metric tons per year) and is calculated as shown below or similar method:

$$CO_{2credit} = \frac{H_s}{2204.6} (K_a) \div .35$$

Where cogeneration credit = The annual CO_2 credit for cogeneration in metric tons/year.

H_s = Annual heat energy supplied by the cogeneration plant to the "steam host" per the contract or other binding obligation/agreement between the parties in mmBtu/yr as substantiated by an engineering analysis.

K_a = The time weighted average CO_2 emission rate constant for the cogeneration plant in lb CO_2/mmBtu supplied. The time weighted average is calculated similarly to the above method described in subsection (1) of this section.

Cogeneration Credit = $CO_{2credit}$ x 30

(4) **Step 4 - Apply the mitigation factor.**

(a) RCW 80.70.020(4) states that "*Fossil-fueled thermal electric generation facilities that receive site certification approval or an order of approval shall provide mitigation for twenty percent of the total carbon dioxide emissions produced by the facility*."

(b) The CO_2 emissions mitigation quantity is determined by the following formula:

Mitigation Quantity = Total CO_2 Emissions x 0.2 - Cogeneration Credit

Mitigation quantity	=	The total CO_2 emissions to be mitigated in metric tons
CO_{2rate}	=	The annual maximum CO_2 emissions from the generating facility in tons/year
0.2	=	The mitigation factor in RCW 80.70.020(4)

(5) Additional restrictions for modifications to an existing facility not involving installation of new generating units. The quantity of CO_2 to be mitigated is calculated by the same methods used for the new generating units with the following restrictions:

(a) The quantity of CO_2 subject to mitigation is only that resulting from the modification and does not include the CO_2 emissions occurring prior to the modification.

(b) An increase in operating hours or other operational limitations established in an order of approval is not an exempt modification under this regulation. However, only emissions related to the increase in operating hours are subject to the CO_2 mitigation program requirements.

(c) The annual emissions ($CO_{2\ rate}$) is the difference between the premodification condition and the postmodification condition, but using the like new heat rate for the combustion equipment.

(d) The cogeneration credit may be used, but only if it is a new cogeneration credit, not a cogeneration agreement or arrangement established prior to July 1, 2004, or used in a prior CO_2 mitigation evaluation.

[7]Review reports and document project progress.

NEW SECTION

WAC 173-407-060 Carbon dioxide mitigation plan requirements and options. (1) **Once the total carbon dioxide emissions mitigation quantity is calculated, what is next?** The facility must mitigate that level of carbon dioxide emissions. A CO_2 mitigation plan is required and must be approved as part of the order of approval. RCW 80.70.020 (2)(b) states that "*For fossil-fueled thermal electric generation facilities not under jurisdiction of the council, the order of approval shall require an approved carbon dioxide mitigation plan*." A mitigation plan is a proposal that includes the process or means to achieve carbon dioxide mitigation through use of mitigation projects or carbon credits (RCW 80.70.010).

(2) **What are the mitigation plan options?** The options are identified in RCW 80.70.020(3), which states that "*An applicant for a fossil-fueled thermal electric generation facility shall include one or a combination of the following carbon dioxide mitigation options as part of its mitigation plan:*

(a) Payment to a third party to provide mitigation;

(b) Direct purchase of permanent carbon credits; or

(c) Investment in applicant-controlled carbon dioxide mitigation projects, including combined heat and power (cogeneration)."

(3) **What are the requirements of the payment to a third party option?** The payment to a third party option requirements are found in RCW 80.70.020 (5) and (6). Subsection (5) identifies the mitigation rate for this option and describes the process for changing the mitigation rate. Subsection (6) describes the payment options.

The initial mitigation rate is **$1.60 per metric ton** of carbon dioxide to be mitigated. If there is a cogeneration plant, the monetary amount is based on the difference between twenty percent of the total carbon dioxide emissions and the cogeneration credit. This rate will change when the energy facility site evaluation council adjusts it through the process described in RCW 80.70.020 (5)(a) and (b). The total payment amount = mitigation rate x mitigation quantity.

An applicant may choose between **a lump sum payment or partial payment over a period of five years.** The **lump sum payment** is described in RCW 80.70.020 (6)(a) and (b). The payment amount is the mitigation quantity multiplied by the per ton mitigation rate. The entire payment amount is due to the independent qualified organization no later than one hundred

twenty days after the start of commercial operation.

The alternative to a one-time payment is a **partial payment** described in RCW 80.70.020 (6)(c). Under this alternative, twenty percent of the total payment is due to the independent qualified organization no later than one hundred twenty days after the start of commercial operation. A payment of the same amount (or an adjusted amount if the rate is changed under RCW 80.70.020 (5)(a)) is due on the anniversary date of the initial payment for the next four consecutive years. In addition, the applicant is required to provide a letter of credit or comparable security for the remaining 80% at the time of the first payment. The letter of credit (or comparable security) must also include possible rate changes.

(4) **What are the requirements of the permanent carbon credits option?** RCW 80.70.030 identifies the criteria and specifies that these credits cannot be resold without approval from the local air authority having jurisdiction or ecology where there is no local air authority. The permanent carbon credit criteria of RCW 80.70.030(1) is as follows:

(a) Credits must derive from real, verified, permanent, and enforceable carbon dioxide or carbon dioxide equivalents emission mitigation not otherwise required by statute, regulation, or other legal requirements;

(b) The credits must be acquired after July 1, 2004; and

(c) The credits may not have been used for other carbon dioxide mitigation projects.

(5) **What are the requirements for the applicant controlled mitigation projects option?** RCW 80.70.040 identifies the requirements for applicant controlled mitigation projects. Subsections (1) through (5) specify the criteria. Subsection (6) specifies that if federal requirements are adopted for carbon dioxide mitigation for fossil-fueled thermal electric generation facilities, ecology or the local air authority may deem the federal requirements equivalent and replace RCW 80.70.040 with the federal requirements.

The applicant controlled mitigation project must be:

(a) Implemented through mitigation projects conducted directly by, or under the control of, order of approval holder. (Section 1);

(b) Approved by the authority having jurisdiction or the department where there is no local air authority and incorporated as a condition of the proposed order of approval. (Section 2);

(c) Fully in place within a reasonable time after the start of commercial operation. Failure to implement an approved mitigation plan is subject to enforcement under chapter 70.94 RCW. (Section 3)

In addition, an order of approval holder may not use more than twenty percent of the total funds for the selection,

monitoring, and evaluation of mitigation projects and the management and enforcement of contracts. (Section 4)

NEW SECTION

WAC 173-407-070 Carbon dioxide mitigation option statement and mitigation plan approval. (1) Applicants must provide the department or authority with a statement selecting the mitigation option(s) at the time the application is submitted.

(2) Applicants choosing to use the payment to a third party or the permanent carbon credit option must provide the department or the authority, as appropriate, with the documentation to show how the requirements will be satisfied before an order or approval will be issued.

(3) Applicants seeking to use the applicant controlled mitigation projects option must submit the entire mitigation plan to the department or the authority. The department or authority having jurisdiction will review the plan. Under RCW 70.94.892 (2)(b), the review criteria is based on whether the mitigation plan is consistent with the requirements of chapter 80.70 RCW.

(4) Upon completing the review phase, the department or the authority having jurisdiction must approve or deny the mitigation plan.

(5) Approved mitigation plans become part of the order of approval.

NEW SECTION

WAC 173-407-080 Enforcement. Applicants or facilities violating the carbon dioxide mitigation program requirements are subject to the enforcement provisions of chapter 70.94 RCW.

NEW SECTION

WAC 173-407-090 Severability. The provisions of this regulation are severable. If any provision is held invalid, the application of that provision to other circumstances and the remainder of the regulation will not be affected.